DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 - 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morse et al (US Patent 6,530,237 B2) in view of Tanaka et al (US Patent 6,016,662 A) and as extrinsically evidenced by Petty (US Patent 5,689,880 A)

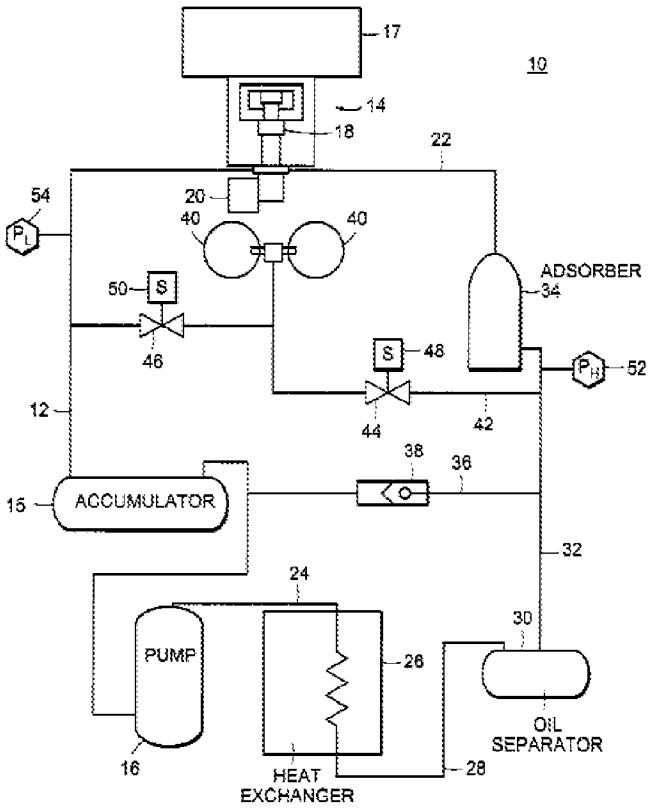


FIG. 4

FIG. 5

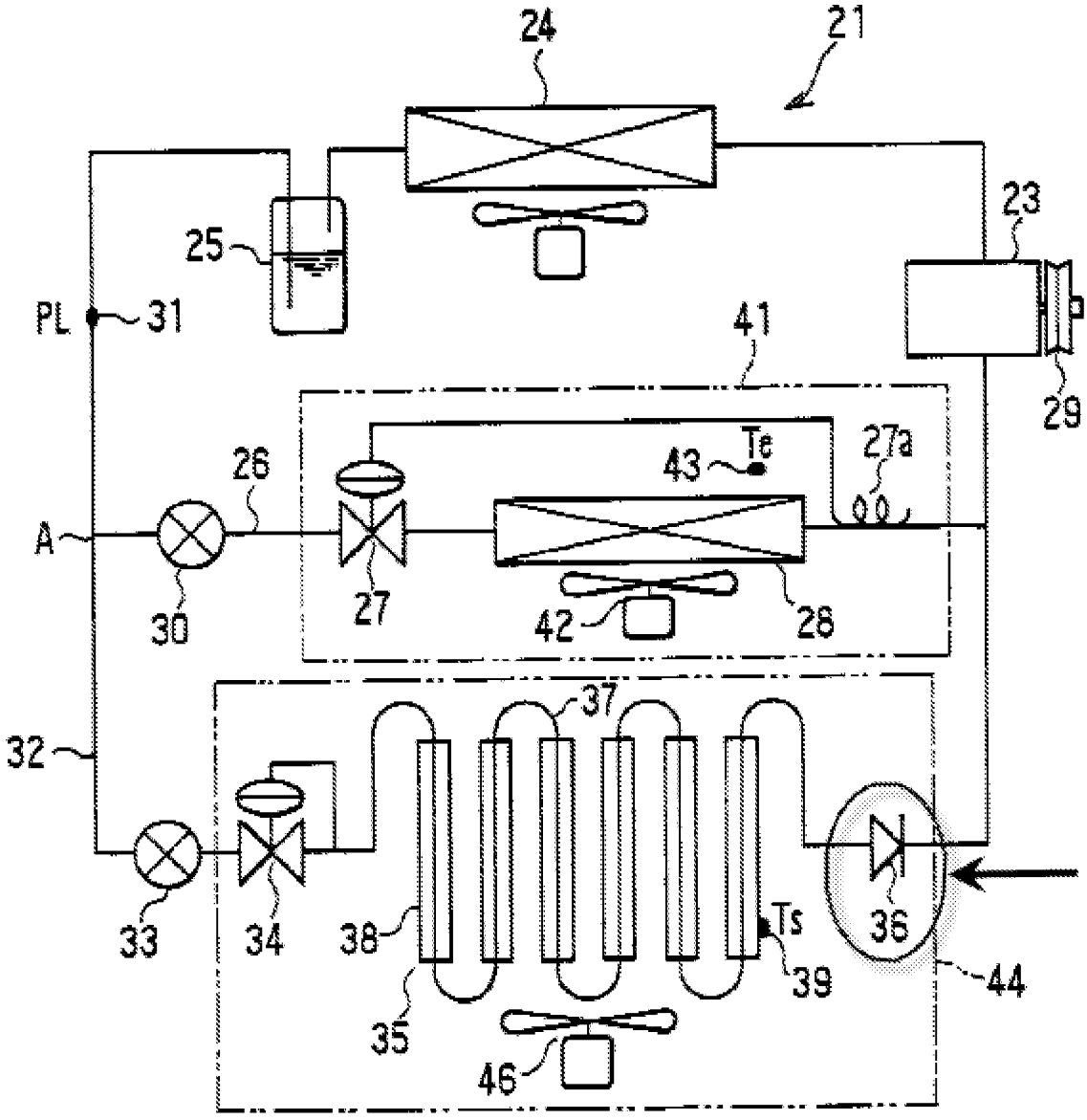


Figure 5 of Tanaka et al

3. In Re claim 1, with reference to Figure 4 above, Morse et al discloses a pumped helium circuit (column 3, lines 25-29) comprising:

- a compressor (16)
- high pressure port which is inherent to the compressor pump outlet
- low pressure port which is inherent to the compressor pump inlet
- supplied equipment (17)
- compressed helium is supplied through line (22) and returns from line (12)
- a pressure relief valve (38) which opens in response to a predetermined pressure differential linking the high and low pressure ports as stated in column 3, lines 55-60: “When the pressure of the helium within the supply line 32 reaches a certain point beyond the pressure necessary to overcome the bias against the valve, the valve opens to allow helium to flow from the helium supply line to the helium return line 12..”
- With regards to “means for preventing oil carry-over from the compressor to the supplied equipment, characterized in that said means comprises means for preventing oil leaving the low pressure port and traveling towards the supplied equipment" within claim 1, this limitation meets the three prong test per MPEP 2181 and thereby invokes 35 USC 112 6th paragraph. The means for preventing oil carry-over from the compressor to the supplied equipment has been disclosed in the specification as a gas reservoir, oil trap or an oil adsorber which prevents oil from leaving the low pressure port and travels towards the supplied equipment. Morse et al discloses an accumulator (15) which provides a "Buffer" as stated in column 3, line 31, and positioned between the supplied equipment and the compressor. In addition, Petty discloses evidence in

Column 1, Lines 13 – 18 that an accumulator typically interposed between en evaporator (supplied equipment) and compressor can function as an oil trap. Also, as applicants suggest in their response to the first office action, the buffer of Morse et al smooths variations in pressure and in order to perform the smoothing function the accumulator needs to be a gas reservoir. The accumulator (15) of Morse et al is therefore is an equivalent element for at least an oil trap or gas reservoir.

4. However, Morse et al does not disclose a non-return valve located between a low pressure side of the pressure relief valve and the supplied equipment.

5. Nevertheless, Figure 5 of Tanaka et al discloses a vehicle air conditioning apparatus comprising a Check Valve (36), a non return valve disposed close the supplied equipment (evaporator) in a refrigeration circuit.

6. It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the pumped helium circuit of Morse et al to incorporate the check valve of Tanaka et al in the helium circuit between a low pressure side of the pressure relief valve and the supplied equipment for the purpose of ensuring one way flow of refrigerant.

7. In Re claim 2 Petty discloses in column 1, line 18 that an accumulator can function as an oil trap.

8. In Re claim 3, while the accumulator of Morse et al does function as an oil trap as discussed above, it does not explicitly disclose that the accumulator could function as

an oil adsorber. However, Morse et al discloses an oil separator and an adsorber on the high pressure side of the compressor which "further filters the helium" as stated in Column 3, Line 50. It would have been obvious to a person having ordinary skill in the art at the time of the invention to incorporate the oil adsorber similar to the one in the high pressure side of the circuit of Morse et al into the accumulator as an additional means to trap oil by trapping more of it through an oil adsorber. Therefore Morse et al modified by Tanaka et al and extrinsically evidenced by Petty as applied to claim 1 discloses all the claimed limitations.

9. In Re claim 4, the accumulator of Morse et al would have to be a gas reservoir as discussed above. Alternatively, Morse et al discloses a gas reservoir (40) between the low pressure port of compressor (16) and the supplied equipment (17).

10. In Re claim 5, with reference to the analysis of claim 1 and 3, the accumulator of Morse et al is a gas reservoir and an oil adsorber.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morse et al (US Patent 6,530,237 B2) in view of Tanaka et al (US Patent 6,016,662 A) as extrinsically evidenced by Petty (US Patent 5,689,880 A) and further in view of Jacobsen et al (US Patent 5,807,075 A)

12. In Re claim 6, Morse et al modified by Tanaka et al and extrinsically evidenced by Petty as applied to claim 1 discloses all the claimed limitations except for a pressure actuated switch in the circuit between the low pressure part and the supplied equipment operable to stop compressor operation in response to low pressure port pressure falling below a minimum value.

13. Nevertheless, Jacobson et al discloses a volumetric pump with an under-pressure sensor disposed at its inlet which signals a microprocessor to shut off the motor if an under-pressure is detected as stated in the Abstract.

14. It would have been obvious to a person having ordinary skill in the art at the time of the invention to further modify the pumped helium circuit of Morse et al to include an under-pressure sensor at the inlet of the compressor and incorporate the microprocessor controlled motor shutdown procedure of Jacobsen et al for the purpose of ensuring safety when a less than the minimum pressure (under-pressure) is detected.

15. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morse et al (US Patent 6,530,237 B2) in view of Hugenroth et al (US Patent 6,190,138 B1)

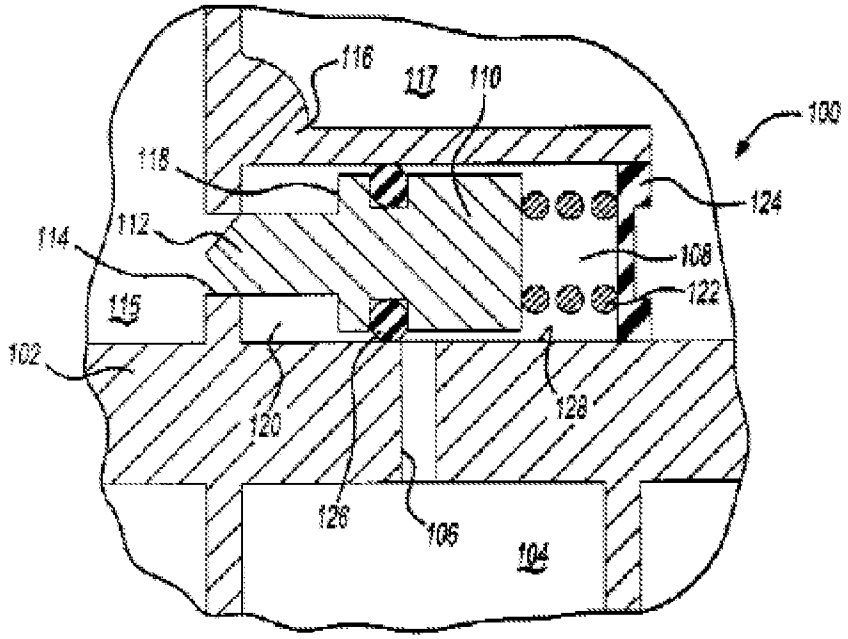


Fig - 5

16. In Re claim 7, as discussed above, Morse et al discloses a pumped helium circuit (column 3, lines 25-29) comprising:

- a compressor (16)
- high pressure port which is inherent to the compressor pump outlet
- low pressure port which is inherent to the compressor pump inlet
- supplied equipment (17)
- compressed helium is supplied through line (22) and returns from line (12)
- a pressure relief valve (38) which opens in response to a predetermined pressure differential linking the high and low pressure ports as stated in column 3, lines 55-60: “When the pressure of the helium within the supply line 32 reaches a certain

point beyond the pressure necessary to overcome the bias against the valve, the valve opens to allow helium to flow from the helium supply line to the helium return line 12.."

17. However, Morse et al does not disclose that the pressure relief valve is connected directly to the compressor from the high pressure port.

18. Nevertheless, in Figure 5 depicted above, Hugenroth et al discloses in Column 5, Lines 29-37, a compressor with a valve element (110) that moves to the right when the pressure in chamber (115) is "too high" and relieves the pressure in chamber (115) to chamber (117) independent of low pressure port. In the process, this pressure relief system avoids additional lines on the non return side thus reducing the potential for additional oil migration.

19. It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the compressor disclosed by Morse et al to incorporate the pressure relief valve element of Hugenroth for the purpose of protecting the compressor as stated by Hugenroth in Column 5, Line 38: "..for providing pressure relief, and protecting the compressor..".

20. In Re claim 8, the apparatus disclosed by Morse et al modified by Hugenroth as applied to claim 7 is inherently capable of performing the method as claimed. Under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device. When the prior art device is the same as a device

described in the specification for carrying out the claimed method, it can be assumed the device will inherently perform the claimed process - MPEP 2112.02.

21. Alternatively, Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morse et al (US Patent 6,530,237 B2) in view of Tanaka et al (US Patent 6,016,662 A) and further in view of Oshima et al (US Patent 3,796,522 A).

22. In Re claim 1, Morse et al modified by Tanaka et al have been discussed above. In addition, Oshima et al provides oil separating means at the suction port of a compressor in Column 2, Lines 8-10: “A primary object of the present invention is to provide a compressor comprising oil separating means provided at a refrigerant suction port thereof, by which the oil present in the refrigerant is separated”.

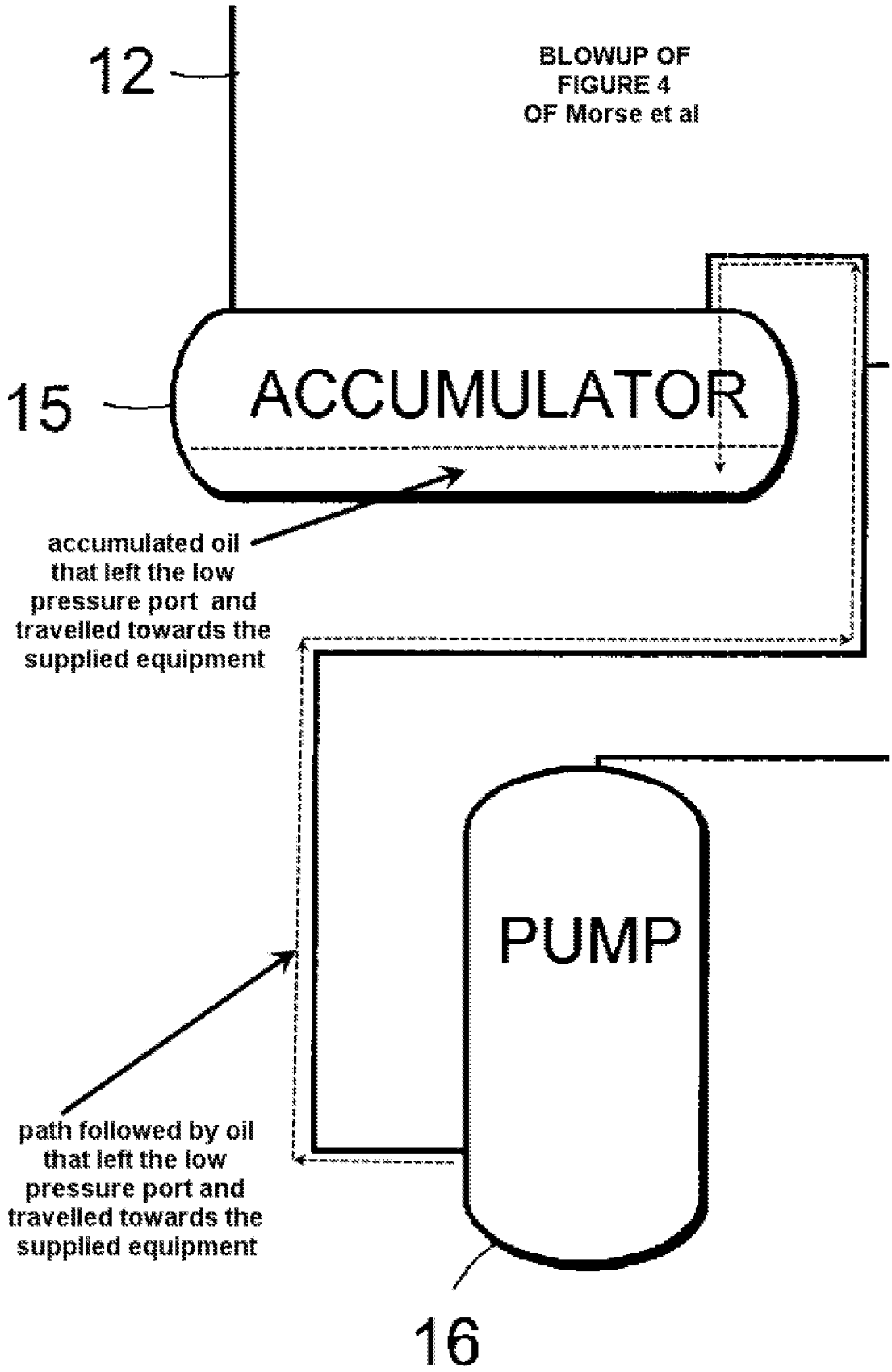
23. It would have been obvious to a person having ordinary skill in the art at the time of the invention to further modify the compressor of Morse et al modified by Tanaka et al to include the oil separation means at the suction port as taught by Oshima et al for the purpose of purpose of “quickly collecting the oil present” as stated by Oshima et al in Column 2, Line 17.

Response to Arguments

24. Applicants have argued that Morse et al does not describe the operation of the accumulator in detail and therefore allegedly does not disclose or suggest preventing oil from "leaving the low pressure port and traveling towards the supplied equipment”.

25. Applicants’ argument has been carefully considered but it is not persuasive because the Accumulator of Morse et al is INHERENTLY capable of preventing oil from

"traveling towards the supplied equipment". Oil migrates along the low pressure line however, the accumulator PREVENTS IT FROM GOING ANY FURTHER beyond it into line (12). MPEP 2112 [R-3] Section I states: "SOMETHING WHICH IS OLD DOES NOT BECOME PATENTABLE UPON THE DISCOVERY OF A NEW PROPERTY". Section II states: "INHERENT FEATURE NEED NOT BE RECOGNIZED AT THE TIME OF THE INVENTION" and Section III states: "A REJECTION UNDER 35 U.S.C. 102/103 CAN BE MADE WHEN THE PRIOR ART PRODUCT SEEMS TO BE IDENTICAL EXCEPT THAT THE PRIOR ART IS SILENT AS TO AN INHERENT CHARACTERISTIC". Therefore even though Morse et al does not explicitly describe the operation of the Accumulator in detail and even if the prevention of oil from traveling towards the supplied equipment was not recognized at the time of the invention by Morse et al, the 102/103 rejection can be made because the function of preventing oil from "traveling towards the supplied equipment" is an inherent characteristic even if the original intent of Morse et al was ONLY to provide a chamber that "likely acts as a buffer simply to smooth variations in pressure" (Applicant's response of April 23, 2008, Page 15). The examiner contends that this "buffer to smooth variations in pressure", over time, will likely accumulate the oil migrating to it from the low pressure line, thereby preventing it from traveling towards the supplied equipment. The oil migrating into the inlet of the accumulator would trickle to the bottom of the accumulator and not reach line (12). The blowup depicted below of Figure 4 of Morse et al illustrates the path of migration of oil along the low pressure return lines by dotted arrows and demonstrates by the annotations how the migrating oil would trickle into the accumulator.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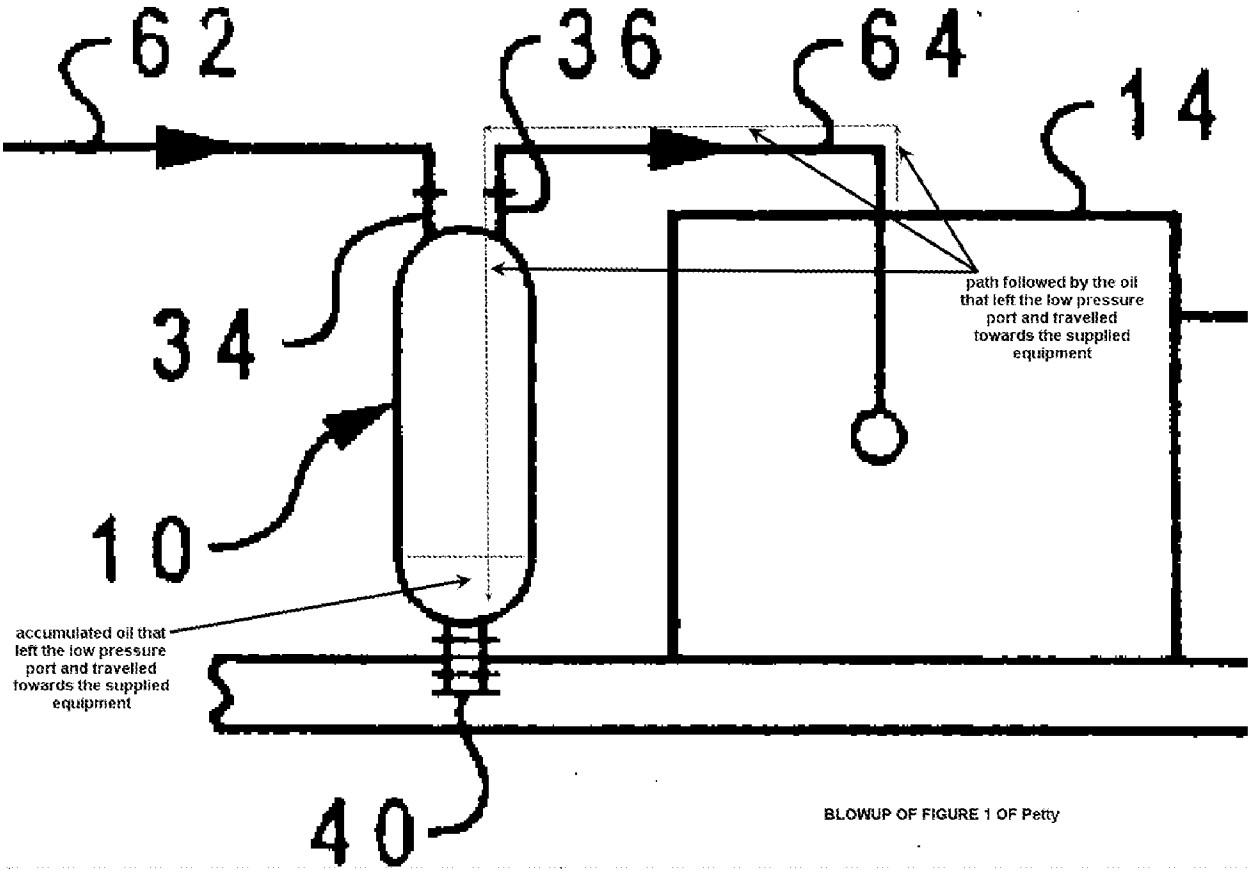
BLOWUP OF
FIGURE 4
OF Morse et al
15
ACCUMULATOR
accumulated oil
that left the low
pressure port and
travelled towards the
supplied equipment
PUMP
path followed by oil
that left the low
pressure port and
travelled towards the
supplied equipment
16

26. Applicant has argued that Tanaka does not disclose preventing oil from traveling towards the supplied equipment, however, this reference was not relied upon for the teaching of prevention of oil from traveling as claimed. Tanaka was only relied on to teach the non return valve as claimed. Similarly, Jacobson were not relied upon for the teaching of prevention of oil from traveling as claimed. Applicant's arguments regarding Oshima et al are not persuasive because it provides additional evidence that the oil that is about to migrate from into the low pressure lines can be preempted and removed from the suction port BEFORE it enters the low pressure lines (Column 2, Lines 8-10). The oil is sucked from the pan as pointed to by the applicant however it is ALSO sucked from the separation chamber (Column 4, Line 14), to keep it from the low pressure lines.

27. Applicant has also argued that Petty does not disclose preventing oil from traveling towards the supplied equipment.

28. Applicants' argument has been carefully considered but it is not persuasive for the following reasons: If the accumulator of Morse et al functions as the accumulator of Petty, it would be INHERENTLY capable of preventing oil from "traveling towards the supplied equipment" because the accumulator of Petty is also INHERENTLY capable of preventing oil from "traveling towards the supplied equipment". Oil migrates along the low pressure line (64) however, the accumulator (10) PREVENTS IT FROM GOING ANY FURTHER beyond it into line (62). This is even more likely with the accumulator of Petty since the oil migrating into the inlet of the accumulator would trickle to the bottom of the elongated chamber of the accumulator and not reach line (62).



29. The blowup depicted above of Figure 1 of Petty illustrates the path of migration of oil along the low pressure return lines by dotted arrows and demonstrates by the annotations how the migrating oil would trickle into the accumulator. Note that the liquid phase of the refrigerant entering from line (62) into the accumulator is also “trapped” at the bottom as stated in Column 4, Lines 39-42 of Petty. Also as mentioned in the earlier office action, Petty clearly discloses in Column 1, Line 17: "The accumulator functions to trap oil ..” which is highly suggestive to one of ordinary skill in the art that the accumulator of Morse et al also “functions to trap oil”.

30. Applicant has argued that Hugenroth does not disclose “the pressure relief valve is connected between the high pressure port and the compressor, independently of the low pressure port".

31. Applicant’s arguments have been carefully considered however they are not persuasive for the following reasons. The term “compressor” could read on the functional elements inside the housing that perform the compression function, for example, the fixed scroll (102) of Hugenroth shown "somewhat schematically" (Column 5, Line 17). The discharge pressure chamber (115) is by definition communicating with/connected to the high pressure port. The valve (112) is experiencing discharge pressure on its triangular face. The valve (112) on its other side, is experiencing the pressure inside the fixed scroll chamber (intermediate chamber 104) through passage (106) disposed on the other side of piston (110). The valve (112) is therefore in a FLUIDIC PATH BETWEEN the discharge chamber/high pressure port and the compression mechanism (fixed scroll, intermediate chamber) since it experiences pressure at the discharge port on one side and pressure in the compression section (fixed scroll) on the other side. The valve (112) is therefore FLUIDICALLY connected BETWEEN the high pressure port and the compression mechanism/compressor and therefore meets this claimed limitation “connected between the high pressure port and the compressor”. The valve allows for discharge from the discharge pressure chamber directly into the suction chamber, and NOT through the suction port/low pressure port therefore the pressure relief valve is connected INDEPENDANTLY of the low pressure port. Note that the pressure relief valve is also connected independently of the high

pressure port. Note also that since the valve is completely disposed inside the hermetically sealed casing, it completely eliminates the possibility of oil migration due to connections and conduits on the outside which could add to the likelihood of oil migration.

32. The examiner therefore respectfully disagrees with the applicants and maintains that this application is not in condition for allowance, since all the rejections made in the previous office action are re-affirmed.

Conclusion

33. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DNYANESH KASTURE whose telephone number is (571)270-3928. The examiner can normally be reached on Mon-Fri, 9:00 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272 - 7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

DGK